

tatis paullo tortis ubique densiuscule albido-pilosulis; vaginis arctissime appressis 5-striatis minute stellato-puberulis; capitulis albis; bracteolis interioribus magnis ampliatis albis.

Annual acaulescent herb; leaves linear, rosulate, thin-textured, 7—10 mm. long, about 0.5 mm. wide, several-striate, glabrous, shiny-green, blunt at the apex; peduncles about 6 per plant, erect, filiform, greenish, 2-costate, very slightly twisted, rather densely whitish-pilosulous throughout; sheaths very closely appressed to the peduncle, 1.7—2.5 cm. long, plainly 5-ribbed, glabrous on the ribs, often very obscurely and minutely stellate-puberulent with blackish hairs in some of the sulcations, obliquely split at the apex, the limb erect and closely appressed to the peduncle; heads white, about 7 mm. wide, Anthemis-like; outer involucre bractlets oblanceolate, pale-stramineous, about 0.8 mm. long and 0.3 mm. wide, rounded at the apex, glabrous; inner involucre bractlets much enlarged, shiny-white, obovate, concave on the upper surface, about 3 mm. long and 1.5 mm. wide, rounded at the apex, glabrous; staminate florets stalked: sepals 3, separate, white, about 1.2 mm. long and 0.3 mm. wide, obtuse at the apex, glabrous; petals 3, connate into a slender tube about 0.6 mm. long, glabrous; stamens 3; pistillate florets not seen.

The type of this species was collected by H. Sick (s.n.) in the Serra do Cachimbo of southern Pará, Brazil, in May, 1957, and is deposited as sheet no. 4703 in the G. F. J. Pabst Herbarium at Rio de Janeiro.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS PSEUDOCARPIDIUM. I

Harold N. Moldenke

This is the twenty-first in my series of monographic works on the genera of Verbenaceae. Previous genera so treated are Aegiphila Jacq., Amasonia L. f., Baillonia Bocq., Bouchea Cham., Casselia Nees & Mart. [Timotocia Moldenke], Castelia Cav., Chascanum E. Mey., Citharexylum B. Juss., Cornutia Plum., Parodianthus Troncoso, Petitia Jacq., Petrea Houst., Priva Adans., Recordia Moldenke, Rehdera Moldenke, Rhaphithamnus Miers, Svensonia Moldenke, Tectona L. f., Vitex Tourn., and the New World and cultivated members of Callicarpa L.

Full explanation of the abbreviations employed herein for the names of the 249 herbaria whose material was examined in the preparation of this work will be found in Phytologia 5: 154—159 (1955) and 6: 242 (1958), with the following additions:

Bd = Herbarium Bradeanum, Rio de Janeiro, Brazil

Gl = Museu Goeldi, Belém, Pará, Brazil

Mm = McGill University, Montréal, Quebec, Canada

Ng = Department of Forests, Lae, New Guinea

Um = University of Montréal Herbarium, Montréal, Quebec, Canada

Wp = University of Manitoba, Winnipeg, Manitoba, Canada

PSEUDOCARPIDIUM Millsp., Field Mus. Publ. Bot. 2: 181. 1906.

Synonymy: *Pleurocarpidium* Millsp. ex Moldenke, Prelim. Alph.

List Invalid Names 36, in syn. 1940.

Literature: A. Rich. in Sagra, Hist. Fis. Cuba 11, Bot. 2: 148—149, pl. 64. 1850; Sagra, Fl. Cuba 4, Atlas Pl. Vasc., ed. 1, pl. 64 (1853), ed. 2, pl. 64. 1863; Griseb., Cat. Pl. Cub. 216—217. 1866; Nicholson, Illustr. Dict. Gard. 4: 186. 1884—1886; Jacks., Ind. Kew. 2: 1213—1214. 1895; Millsp., Field Columb. Mus. Publ. Bot. 2: 181—182. 1906; N. L. Britton, Bull. Torrey Bot. Club 39: 10. 1912; Prain, Ind. Kew. Suppl. 4: 192. 1913; Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481. 1917; N. L. Britton, Mem. Torrey Bot. Club 16: 98. 1920; Britton & Millsp., Bahama Fl. 374. 1920; Prain, Ind. Kew. Suppl. 5: 209. 1921; Urb. in Fedde, Repert. 20: 346. 1924; Hill, Ind. Kew. Suppl. 6: 167. 1926; Urb. & Ekman, Arkiv Bot. 22A (10): 107. 1929; Hill, Ind. Kew. Suppl. 7: 252. 1929; Stapf, Ind. Lond. 6: 478. 1931; Hill, Ind. Kew. Suppl. 8: 249. 1933; Junell, Symb. Bot. Upsal. 4: 94 & 201. 1934; Moldenke, Revist. Sudam. Bot. 5: 2. 1937; Moldenke, Geogr. Distrib. Avicenn. 1, 5—7, & 39. 1939; Moldenke, Alph. List Common Names 8, 22, & 25. 1939; Moldenke, Suppl. List Common Names 24. 1940; Moldenke, Prelim. Alph. List Invalid Names 36 & 50—52. 1940; Carabia, Chron. Bot. 6: 227. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24—26, 74, & 99. 1942; Moldenke, Alph. List Invalid Names 36 & 52—56. 1942; Moldenke, Phytologia 2: 111. 1944; Moldenke, Alph. List Cit. 1: 55, 61, 63, 64, 74, 75, 109, 120, 184—189, 298, 309, 321, & 322. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 185. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 83. 1948; Moldenke, Alph. List Cit. 2: 543, 578, 646, 647, 650, & 651 (1948), 3: 664, 773, 868, 880, 895, 927—930, & 943 (1949), and 4: 986, 1127, 1137, 1143, & 1144. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 42, 44, 45, 48, 163, & 195. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 11. 1949; Roig, Dicc. Bot. 1: 301—302, 344—345, 427—428, & 695 and 2: 1087 & 1115. 1953; Moldenke, Phytologia 5: 151 & 152. 1955; Alain in León & Alain, Fl. Cuba 4: 280, 314—316, & 545, fig. 136. 1957; Moldenke, Résumé 50, 53, 54, 57, 222, 381, 383, 384, 386, 388, 389, 391, 409, & 468. 1959.

The original generic description is "Shrubs or low trees; leaves simple, opposite, entire or crenate-dentate; flowers paniculate; calyx campanulate, 5-dentate, equal; corolla tubular, 5-fid; stamens 4, didynamous, exserted; stigma bifid; drupe 2-pyrened; pyrenes osseous, 2-celled, 1-seeded, located in the center of the drupe. $\psi\epsilon\upsilon\delta\eta\varsigma$ false, $\kappa\alpha\rho\tau\iota\delta\iota\omicron\nu$ carpid, in reference to the four carpid-like prominences on the fruit — these apparent cocci are simply fleshy masses, Richard's fig. 3, pl. 64, to the contrary notwithstanding."

The members of this genus are shrubs or small and low straggling trees, 2--8.5 m. tall, often branched from the base; trunk to 45 cm. in diameter at the base; branches mostly woody, stiff, with slender circular pith; branchlets rather slender or medium-slender to medium-stout, usually twiggy, usually obscurely or very obtusely tetragonal when young and subterete in age, varying from buff or brownish to gray, light-gray, whitish, or even silvery, the younger parts usually finely or densely short-puberulent with brownish, flavescent, or sordid hairs, becoming glabrescent in age, often rather rigid; twigs similar to the branchlets in most respects, often very numerous, short, decussate-opposite, usually more conspicuously tetragonal, sometimes with the pubescence interspersed with tiny resinous globules; leaf-scars usually not prominent on older wood, sometimes somewhat prominent and corky on branchlets and twigs; nodes sometimes distinctly or obscurely annulate, at least on the younger wood, sometimes slightly swollen; principal internodes 0.2--4.3 cm. long or to 7.3 cm. long on vigorous shoots, sometimes greatly abbreviated on very short stunted or spur-like twigs or even almost obsolete; leaves decussate-opposite, apparently simple but probably actually 1-foliolate, often crowded on short twigs and absent from older wood, usually very leathery and stiff, often very revolute, sometimes like Ilex opaca Ait. in general form, frequently very variable even on the same branch; petioles slender or very slender, 1--9 mm. long, rather densely short-pubescent or tomentulose to puberulent or short-puberulent with canescent, flavescent, or brownish hairs, sometimes merely pulverulent, rarely glabrate, not articulate-jointed, often flattened and more or less canaliculate above, usually not at all or only very slightly ampliate at the base, the puberulence sometimes interspersed with tiny resinous globules; leaf-blades subcoriaceous or coriaceous, varying from dark- or bright-green to light- or gray-green above, sometimes darker but usually dull and very pale or even whitish beneath, often very irregular in size and shape on the same branch, varying from elliptic or narrowly elliptic to oblong or oblong-lanceolate, rarely oblanceolate, narrowly obovate, or even orbicular, often more or less asymmetric, 0.9--9.3 cm. long, 0.4--5 cm. wide, varying from rounded, obtuse, or bluntly subacute to acute, sharply acute, or acuminate and often spinulose at the apex, rarely emarginate, varying from acute, subacute, or cuneate to obtuse, broadly rounded, or even subcordate or cordate at the base, varying from entire or subentire and more or less revolute to irregularly spinulose-dentate with often large and coarse triangular teeth and elongated spines along the margins, often undate or sinuate, sometimes abundantly spinulose from base to apex or entire only near the base, rarely somewhat asymmetrically 1- or 2-lobed toward the apex, often densely puberulent or granular-pulverulent above when immature, glabrous and shiny above when mature, sometimes very shiny and glossy above at all times, varying from short-tomentulose or short-pubescent to puberulent or pulverulent beneath, with usually matted

canescent, cinereous, or sordid hairs, often also more or less granular-pulverulent on the midrib and larger venation, sometimes pustulate or silvery beneath, occasionally glabrate only on the lamina beneath, rarely very shiny and glossy throughout, sometimes the puberulence interspersed with tiny resinous globules, the very immature ones sometimes chartaceous and nigrescent in drying, the marginal spines often 1—1.5 mm. long; midrib slender, varying from flat to subimpressed or even deeply impressed above, usually very strong and prominent to the apex beneath; secondaries slender, 3—18 per side, short, often very irregular, sometimes close together, divergent from the midrib at almost right angles or more or less arcuate-ascending, often conspicuously anastomosing or arcuately joined near the margins beneath, varying from subimpressed to subprominent (sometimes in a slight channel) or obscure (sometimes indiscernible) above, usually very strong and conspicuously prominent or prominent beneath, sometimes slightly webbed at the base, rarely very obscure or even indiscernible on both surfaces, occasionally conspicuously anastomosing to form a rather uniform collective vein close to the margins beneath; vein and veinlet reticulation fine and abundant, varying from indiscernible or obscure to subprominent to the finest details above, all very prominent or only the larger portions prominent beneath, sometimes much darker than the cinereously pubescent lamina, rarely obscure or even indiscernible beneath; inflorescence axillary, paniculate, 2—16 cm. long, 1—6.5 cm. wide, solitary or paired, usually composed of 1—7 pairs of often irregularly disposed and lax rather few-flowered or uniformly 3-flowered cymules and a terminal one, the larger ones often bracteate, sometimes very slender and tenuous throughout; peduncles very slender or filiform, 0.5—6.1 cm. long, densely short-puberulent or pulverulent like the twigs, often whitish, rarely glabrous, often flattened; rachis usually similar to the peduncle and twigs in all respects, its sympodia 0.4—2.5 cm. long, mostly rather elongate; pedicels obsolete or filiform, 1—3 mm. long, densely short-puberulent or pulverulent, sometimes whitish, rarely glabrous; bracts (when present) usually only 1 or 2 pairs, subtending the lowermost cymules, foliaceous, varying from elliptic or narrow-elliptic to lanceolate or oblong, stipitate or long-stipitate, 0.5—1.5 cm. long, 1—3 mm. wide, sharply acute or spinulose at the apex, entire, glabrous and shiny above, densely canescent- or sordid-puberulent beneath, rarely glabrous, usually similar to the leaves in pubescence; bractlets numerous, a pair subtending each pair of inflorescence-branches, linear or elliptic to narrowly lanceolate or oblanceolate, sessile or subsessile, 1—4 mm. long, about 1 mm. wide, mostly densely pubescent or puberulent throughout on both surfaces, rarely glabrous, sometimes recurved; prophylla minute, linear to setaceous or subulate, sharply acute, usually about 1 mm. long, mostly densely puberulent, rarely glabrous; calyx campanulate, usually about 2 mm. long and 1 mm. wide, mostly densely whitish- or finely puberulent on the outer surface, glab-

rous within, its rim plainly 5-dentate with ovate-triangular, equal, sharply acute and more or less apiculate teeth; corolla hypanocrateriform, blue or blue-purple, usually about 5 mm. long, mostly more or less puberulent, the limb 5-fid; stamens 4, didynamous, exserted: stigma bifid; fruiting-calyx persistent, slightly enlarged, membranous or incrassate, patelliform or shallowly cupuliform, about 3 mm. long, 2--4.5 mm. in diameter, flaring, usually densely puberulent throughout on the outer surface, rarely glabrous, always glabrous on the inner surface, mostly deeply split and flattened under the mature fruit into one 2-toothed and one 3-toothed portion, the halves often divaricately spreading or appressed, mostly not split and with its rim distinctly 5-toothed when immature, rarely not split and only irregularly 5-lobed when mature, scarious-margined, often taking out with it from the fruit a slight core 1 mm. long and being removed, the teeth triangular, sharply acute, more or less uniform; fruit drupaceous, deeply 4-lobed, flattened or even conspicuously depressed-flattened, 2--5 mm. long, 4--10 mm. wide, mostly densely flavescent-short-pubescent or granular-pulverulent throughout, rarely glabrous, the lobes fleshy, usually subequal and rounded or else one lobe sometimes much attenuate and spur-like and the three other lobes each again 2-lobulate, rarely with two lobes much larger than the other two, at maturity less densely pubescent and also more attenuate at the base, mostly umbilicate at the base, often deeply so when the fruiting-calyx has been removed, composed of 2 osseous pyrenes, each 2-celled, 1-seeded, and located in the center of the drupe.

This small genus of eight known species is found in the West Indies from the Bahama Islands, through Cuba and Isla de Pinos, to Hispaniola; one species is said to occur in cultivation. The members of the genus grow at elevations from sea-level to 150 m., inhabiting mostly calcareous soil of dry hills, hillsides, dry calcareous and coastal thickets, hedges, steep mountainsides, coastal cliffs, limestone ledges and cliffs, flat rocks, coral-line soil, and streamsides. They have been collected in anthesis from March through December, and in fruit from February to April and July to November. The type of the genus is P. wrightii Millsp.

Urban was of the opinion that the genus is not distinct from Vitex Tourn., and B. L. Robinson apparently agreed. Junell states that "Die Gattung unterscheidet sich durch ihren Fruchtbau von Vitex. Die Frucht ist eine Steinfrucht mit zwei Steinen. Die Fruchtknotenbau entspricht dem bei Vitex. Die Plazenten verwachsen in der Höhe der oberen Teil der Samenanlagen. Die Fruchtblattränder sind vollkommen verwachsen. Es liegen keine Andeutungen von 'falschen' Scheidewänden vor."

In all, 349 herbarium specimens and 28 mounted photographs have been examined.

An artificial key to the species of Pseudocarpidium

1. Leaf-blades essentially glabrous beneath.

2. Lower leaf-surface (under hand-lens) densely pustulate.....
P. pungens.
- 2a. Lower leaf-surface (under hand-lens) not pustulate.
3. Twigs, peduncles, pedicels, calyx, and fruit glabrous.....
P. rigens.
- 3a. Twigs, peduncles, pedicels, calyx, and fruit densely puberulent.....P. wrightii.
- 1a. Leaf-blades more or less puberulent beneath.
4. Leaf-blades finely and sparsely puberulent (chiefly on the larger venation) beneath.
5. Lower leaf-surface (under hand-lens) densely pustulate throughout; leaf-blades narrow and acute at the base....
P. pungens.
- 5a. Lower leaf-surface (under hand-lens) not pustulate; leaf-blades mostly broad and rounded at the base.....
P. wrightii.
- 4a. Leaf-blades very densely puberulent throughout on the lower surface.
6. Leaf-blades essentially entire.
7. Puberulence on the lower leaf-surface white; leaf-blades cuneate at the base, to 3.7 cm. long (mostly much less), 6--10 mm. wide, oblong or oblong-lanceolate....
P. shaferi.
- 7a. Puberulence on the lower leaf-surface brownish; leaf-blades rounded or acute at the base, to 7.8 cm. long and 3.2 cm. wide, mostly elliptic....P. avicennioides.
- 6a. Leaf-blades spinulose-dentate.
8. Leaf-blades narrow-elliptic, abundantly short-spinulose, with 4--6 teeth per mm. of margin.....P. multident.
- 8a. Leaf-blades usually more broadly elliptic, more remotely spinulose.
9. Hispaniolan; teeth large and coarse, rather uniform; leaf-apex triangular-acuminate and long-spined.....
P. domingense.
- 9a. Cuban; teeth small, often very irregular, distant, or even absent; leaf-apex rounded in outline, short-apiculate or merely acute.
10. Lower leaf-surface very strikingly reticulate with prominently elevated venation, the puberulence on the venation sparser and brownish, that on the interstices very dense and white.....P. ilicifolium.
- 10a. Lower leaf-surface with usually only the midrib and secondaries prominently elevated, not strikingly reticulate, uniformly grayish- or brownish-puberulent throughout.....P. avicennioides.

PSEUDOCARPIDIUM AVICENNIOIDES (A. Rich.) Millsp., Publ. Field Columb. Mus. Bot. 2: 182. 1906.

Synonymy: Vitex avicennioides A. Rich. in Sagra, Hist. Fis.

Cuba 11, Bot. 2: 149. 1850.

Literature: A. Rich. in Sagra, Hist. Fis. Cuba 11, Bot. 2: 149. 1850; Griseb., Cat. Pl. Cub. 216. 1866; Jacks., Ind. Kew. 2: 1213. 1895; Millsp., Publ. Field Columb. Mus. Bot. 2: 182. 1906; Moldenke, Geogr. Distrib. Avicenn. 5. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25 & 99. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Moldenke, Alph. List Cit. 1: 61, 64, 75, 109, 184, 185, 187, 321, & 322 (1946), 2: 543 & 647 (1948), 3: 664 (1949), and 4: 986 & 1143. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 44 & 195. 1949; Moldenke, Phytologia 5: 151. 1955; Alain in León & Alain, Fl. Cuba 4: 314 & 315, fig. 136. 1957; Moldenke, Résumé 53, 381, & 468. 1959.

Illustrations: Alain in León & Alain, Fl. Cuba 4: fig. 136. 1957.

A shrub or small tree, to 6 m. tall; branchlets and twigs rather slender, obscurely tetragonal or subterete, light-gray or brownish, densely short-puberulent, becoming glabrescent in age, rather rigid; nodes mostly distinctly annulate, at least on younger wood; principal internodes 0.5--2.5 cm. long, sometimes greatly abbreviated on very short spur-like twigs; leaves decussate-opposite, simple, often crowded on short twigs, frequently very revolute; petioles very slender, 1.5--7 mm. long, densely puberulent with canescent or flavescent hairs, not jointed; leaf-blades subcoriaceous or coriaceous, light- or dark-green above, cinereous beneath, narrowly elliptic, 2.5--7.8 cm. long, 1--3.2 cm. wide, sharply acute and often spinulose at the apex, varying from acute to obtuse or even cordate at the base, varying from entire and more or less revolute to irregularly spinulose-dentate along the margins, densely puberulent above when immature, glabrous and shiny when mature, always densely short-pubescent, puberulent, or even tomentulose with canescent or sordid hairs beneath; midrib slender, mostly subimpressed above, very strong and prominent beneath; secondaries slender, 6--10 per side, short, divergent from the midrib at almost right angles or ascending, usually conspicuously anastomosing near the margins beneath, subprominent (sometimes in a slight channel) or obscure above, usually very conspicuously prominent beneath; vein and veinlet reticulation fine and abundant, obscure or subprominent to the finest detail above, only the larger portions prominent beneath; inflorescence axillary, paniculate, 4--10 cm. long, 1--3.5 cm. wide, solitary or paired, usually composed of 3 or 4 pairs of rather few-flowered cymes and a terminal one, the larger ones often bracteate; peduncles very slender, 1.4--5.5 cm. long, densely puberulent like the twigs; rachis similar to the peduncle in all respects, its sympodia mostly rather elongated; pedicels filiform, about 1 mm. long and densely puberulent, or obsolete; bracts, when present, one pair, subtending the lowermost cymes, foliaceous, narrow-elliptic, stipitate, to 1.5 cm. long and 6 mm. wide, sharply acute, entire, glabrous and shiny above, densely canescent- or sordid-puberulent beneath; bractlets numerous, linear, sessile, 1--4 mm. long, densely pubescent

throughout on both surfaces; prophylla minute, setaceous or subulate, densely puberulent; fruiting-calyx slightly enlarged, densely puberulent throughout outside, deeply split and flattened under the mature fruit into one 2-toothed and one 3-toothed portion; fruit deeply 4-lobed, flattened, 3--5 mm. long, 6--8 mm. wide, densely flavescent-short-pubescent throughout, the lobes usually subequal and rounded, at maturity less densely pubescent and more attenuate at the base, umbilicate at the base.

The type of this species was collected by Jean Jules Linden (no. 2053) in the Cerro de Cobre, near Santiago, Oriente, Cuba, in July or August, 1844. The species inhabits hillsides, coastal thickets, dry hills, coralline soil, and limestone cliffs, often facing bays or even depressed by the action of wind over flat rocks, ascending from sea-level to 150 meters altitude. It has been collected in anthesis in April, June, July, August, and October, and in fruit in March, September, and October. The leaf-margins vary tremendously, as do also the shape of the leaf-blade and the shape of the leaf-base, often on the same branch. The leaves and stems are frequently attacked by gall-insects, which produce crateriform galls on them. Scale-insects are frequently found on the lower leaf-surface, and species of *Tillandsia* often grow on the branches. Specimens of this species have been confused in herbaria with *P. pungens* Britton, *P. shaferei* Britton, *P. wrightii* Millsp., and with the genera *Duranta* L. and *Cornutia* Plum. — in fact, specimens have been annotated as "*Cornutia* n. sp." and as *Vitex ilicifolia* A. Rich.

A packet of *C. Wright* 431 in the herbarium of the Field Museum at Chicago is marked "type" of *P. wrightii* in error, and a fragment of *Linden* 2053 in the same herbarium is labelled "So. America" in error. The *N. Taylor* 19 cited by Britton as *P. pungens* is certainly *P. avicennioides* instead!

In all, 66 herbarium specimens, including the type collection, and 7 mounted photographs have been examined.

Citations: CUBA: Oriente: *Acuña* 10207 (Es); *Alain, Clément, & Chrysogone* A.838 (N); *Alain & López Figueiras* 4206 (Z); *N. L. Britton* 1920 (N, N); *Britton & Cowell* 12732 (B, N, W-698403); *Eucher* 5 (F-598896); *Clément* 125 (Ha, N), 279 (Ha, N), 2236 (Ha, N), 2675 (Ha, N), 2688 (Ha); *Ekman* 2867 (B, S), 7826 (B, N, S), 7835 (B, N-photo, S, Z-photo), 15616 (B, S); *Hioram* 2046 (N); *León* 11666 [Herb. Roig 5794] (Es, Ha, N), 12375 (Ha, N), 16370 (Ha, N), 17691 (Ha, N); *Linden* 2053 (B-isotype, B-photo of isotype, Bm-isotype, Br-isotype, Br-isotype, Cb-isotype, F-600265-isotype, F-976357-isotype, K-isotype, K-isotype, K-isotype, K-photo of isotype, N-isotype, N-photo of isotype, P-isotype, S-photo of isotype, X-isotype, Z-photo of isotype), 2054 (B, Br); *N. Taylor* 19 (N); *C. Wright* 431, in part [1856-7] (B, Br, Cb, D-611964, E-116125, F-181690, F-870972, G, K, N, Os, T, X).

PSEUDOCARPIDIUM DOMINGENSE (Urb. & Ekm.) Moldenke, Revist. Sudam. Bot. 5: 2. 1937.

Synonymy: Vitex domingensis Urb. & Ekm., Arkiv Bot. 22A (10): 107. 1929.

Literature: Urb. & Ekm., Arkiv Bot. 22A (10): 107. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Revist. Sudam. Bot. 5: 2. 1937; Moldenke, Geogr. Distrib. Avicenn. 7. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 26 & 99. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Alph. List Cit. 1: 188 & 189. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 185. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 48 & 195. 1949; Moldenke, Phytologia 5: 151. 1955; Moldenke, Résumé 57, 383, & 468. 1959.

Shrub or small tree; branchlets and twigs rather slender, stiff, obscurely tetragonal or subterete, gray, the youngest parts densely short-puberulent, the older parts glabrescent; nodes usually not noticeably annulate (or annulate only on the youngest twigs), usually slightly swollen; principal internodes 0.2--4.3 cm. long, usually much abbreviated; leaves decussate-opposite, abundant and crowded, simple, decidedly holly-like, stiff and prickly; petioles very slender, 1--4 mm. long, rather densely pulverulent and puberulent; leaf-blades coriaceous, bright-green above, cinereous beneath, elliptic, 1--5.7 cm. long, 0.5--2.3 cm. wide, mostly very irregular in size and shape on the same branch, acute or acuminate and usually long-spinulose at the apex, acute at the base, irregularly spinulose-dentate with mostly large and coarse triangular teeth and elongated spines along the margins, undate and sinuate, usually more or less asymmetric, densely granular-pulverulent above, becoming glabrous and shiny in age, very densely short-tomentulose with matted cinereous or sordid tomentum beneath and usually also more or less granular-pulverulent on the midrib and larger venation or sometimes only pulverulent and only sparsely puberulent; midrib slender, subimpressed above, very strong and prominent beneath; secondaries slender, 3--10 per side, usually very irregular, mostly subimpressed (or subprominent in a shallow channel) above, very strong and prominent beneath, often slightly webbed at the base, arcuate-ascending, often conspicuously anastomosing near the margins; vein and veinlet reticulation abundant, mostly rather obscure above, very prominent beneath; inflorescence axillary, paniculate, 2.5--6.5 cm. long, 1.5--4 cm. wide, composed of 2--4 pairs of often irregularly disposed rather few-flowered cymules and a terminal one, very temuous, densely short-puberulent and pulverulent throughout, often bracteate; peduncles (1--4 cm. long) and rachis very slender or filiform, the sympodia mostly rather elongate; pedicels filiform, 1--2 mm. long, densely puberulent and pulverulent; bracts, when present, foliaceous, elliptic, stipitate, to 7 mm. long and 3 mm. wide, entire, similar to the leaves in pubescence; bractlets linear or elliptic, puberulent, 1--4 mm. long; prophylla minute, subulate-setaceous;

corolla blue; fruiting-calyx slightly enlarged, flattened under the mature fruit and deeply split into two divergent halves, one half 2-toothed and the other 3-toothed, densely puberulent throughout; fruit flattened, about 3 mm. long and 6 mm. wide, 4-lobed with subequal rounded lobes, densely short-pubescent with flavescent hairs and granular-pulverulent.

The type of this handsome species was collected by Erik Leonard Ekman (no. H.8489) on Eocene limestone at Presqu'île du Nord-Ouest, Les Gonaïves, towards La Pierre, Haïti, on June 19, 1927, and is deposited in the herbarium of the Botanisches Museum at Berlin. The species is said by Ekman to inhabit coastal cliffs, limestone cliffs, and steep mountainsides, and to be "not common". It is, however, said to be fairly abundant on Quaternary and Eocene limestone formations. It has been collected in anthesis in June, July, September, and October, and in fruit in July and September. In all, 23 herbarium specimens, including the type, and 6 mounted photographs have been examined.

Citations: HISPANIOLA: Dominican Republic: Ekman H.6941 (B, N, N—photo, S, Z—photo). Haïti: Ekman H.4532 (B, N, S, W—1304709), H.6996 (B, F—839450, Mi, S), H.7096 (B, S, W—1304612), H.8489 (B—type, F—839445—isotype, Mi—isotype, N—isotype, N—photo of type, N—photo of isotype, S—isotype, W—1413094—isotype, W—1479718—isotype, Z—photo of type, Z—photo of isotype), H.8673 (B, S).

PSEUDOCARPIDIUM ILICIFOLIUM (A. Rich.) Millsp., Publ. Field Columb. Mus. Bot. 2: 182. 1906.

Synonymy: Vitex ilicifolia A. Rich. in Sagra, Hist. Fis. Cuba 11, Bot. 2: 148, pl. 64. 1850.

Literature: A. Rich. in Sagra, Hist. Fis. Cuba 11, Bot. 2: 148, pl. 64. 1850; Sagra, Fl. Cub. 4, Atlas Pl. Vasc., ed. 1, pl. 64 (1853) and ed. 2, pl. 64. 1863; Griseb., Cat. Pl. Cub. 217. 1866; Nicholson, Illustr. Dict. Gard. 4: 186. 1884—1886; Jacks., Ind. Kew. 2: 1213. 1895; Millsp., Publ. Field Columb. Mus. Bot. 2: 182. 1906; Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481. 1917; Stapf, Ind. Lond. 6: 478. 1931; Junell, Symb. Bot. Upsal. 4: 94. 1934; Moldenke, Geogr. Distrib. Avicenn. 5 & 39. 1939; Moldenke, Alph. List Common Names 8, 22, & 25. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25, 74, & 99. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Phytologia 2: 111. 1944; Moldenke, Alph. List Cit. 1: 186 & 187 (1946), 2: 651 (1948), 3: 868 & 880 (1949), and 4: 1137 & 1143. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 44, 163, & 195. 1949; Roig, Dicc. Bot. 2: 1115. 1953; Moldenke, Phytologia 5: 151. 1955; Alain in León & Alain, Fl. Cub. 4: 314, 315, & 545. 1957; Moldenke, Résumé 53, 222, 384, & 468. 1959.

Illustrations: A. Rich. in Sagra, Hist. Fis. Cuba 11, Bot. 2: pl. 64. 1850; Sagra, Fl. Cub. 4, Atlas Pl. Vasc., ed. 1, pl. 64 (1853) and ed. 2, pl. 64. 1863; Nicholson, Illustr. Dict. Gard. 4:

186. 1884--1886.

Shrub or small tree, to 8.5 m. tall; branchlets and twigs slender, gray, obscurely tetragonal or subterete, stiff, the youngest parts densely short-puberulent with flavescent or sordid hairs; nodes slightly annulate on the youngest parts, not noticeably so on older wood, slightly swollen; principal internodes 0.2--4 cm. long, mostly greatly abbreviated; leaves decussate-opposite, simple; petioles slender, 3--9 mm. long, flattened above, densely short-puberulent; leaf-blades subcoriaceous or coriaceous, dark-green and often rather shiny above, cinereous or silvery beneath, elliptic, 2--8 cm. long, 1--3.5 cm. wide, obtuse or acute and usually spinulose at the apex (rarely emarginate), obtuse or acute at the base, rarely subcordate, irregularly spinulose-dentate (or rarely subentire) along the margins, usually more or less undate and sinuate and slightly revolute, often asymmetric, puberulent or pulverulent above (becoming glabrous in age), densely short-pubescent beneath (but not so dense as to hide the veinlet reticulation) with cinereous hairs; midrib slender, subimpressed or flat above and usually puberulous, very strong and prominent to the apex beneath; secondaries slender, 4--10 per side, short, irregular, issuing at almost right angles to the midrib or slightly ascending, subimpressed and puberulous or obscure above, prominent beneath, anastomosing near the margins; vein and veinlet reticulation indiscernible above, very abundant and conspicuously prominent to the finest detail beneath, appearing much darker than the cinereously pubescent lamina; inflorescence axillary, paniculate, 4--9.5 cm. long, 1--4 cm. wide, composed of 3--6 pairs of very lax usually 3-flowered cymules, often quite irregular, very slender and tenuous throughout; peduncles (0.5--2.5 cm. long) and rachis very slender or filiform, rather densely puberulent like the petioles and twigs, the sympodia mostly elongate; bracts (when present) foliaceous, elliptic, usually only 1 or 2 pairs subtending the lowermost cymes, entire, stipitate, to 1.5 cm. long and 8 mm. wide, spinulose at the apex, resembling the leaves in puberulence; bractlets linear, numerous, 1--4 mm. long, often recurved, puberulent throughout; prophylla minute, linear or subulate, about 1 mm. long, puberulent; corolla blue; fruiting-calyx slightly enlarged, flattened under the mature fruit and split into 2 divaricate-spreading or appressed halves, one half 2-toothed and the other 3-toothed, puberulent, throughout on the outside; fruit flattened, 2--3 mm. long, 5--6 mm. wide, 4-lobed, densely short-puberulent throughout, the lobes subequal and rounded.

The type of this species was collected by Ramón de la Sagra at Canasi, Cuba, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The species has been collected in anthesis in June, July, November, and December, and in fruit in July. It has been found along streams, in hedges, on limestone ledges and the edges of cliffs, on limestone rocks, and is said to be common in calcareous soil and hills. P. Wilson 11401 is from a tree which had the base of the trunk 18 inches in

diameter, its leaves are unusually large, the petioles long, the under-surface silvery, and the calyx and corolla large. Roig and León report that the wood is used. Mostly the leaf-blades are more or less puberulent above. Rehder reports that the species occurs in cultivation, but I have as yet seen no cultivated material of it. Herbarium material of this species has been confused with P. wrightii and has even been misidentified as Vitex avicennnoides A. Rich., but its conspicuous vein and veinlet reticulation on the lower leaf-surface distinguishes it at once. In all, 41 herbarium specimens, including the type, and 3 mounted photographs have been examined.

Vernacular names reported are "chicharrón", "granadillo de costa", "navaja de verraco", "pico de cotorra", and "yanilla blanca".

Citations: CUBA: Camagüey: Roig, Luaces, & Arango 417 [Herb. Roig 815a] (Rg). Havana: León & Roig 11443 (Ha, N); Roig 8134 (Es); Roig & Acuña s.n. (Es--14055, Es); Roig & León s.n. [Herb. Roig 2523] (Es). Las Villas: León 14619 (Ha). Matanzas: Ekman 17215 (B, S); Rugel 310 (B, B, Bm, D, G, K, K, Le, Le, Le, N), 806 (M, N), s.n. [Punta Brava, 1849] (Bm, M); Sagra s.n. [Canasi] (P--type, P--isotype); Seifríz s.n. [León 17954] (Ha). Oriente: Ekman 8945 (B, S). Pinar del Río: Ekman 13027 [13037] (B, E--photo, N, N--photo, S, Z--photo); P. Wilson 11401 (N, N). Province undetermined: C. Wright 100 (B), 431, in part [1865; Herb. Sauvalle 1786] (Hv), 431, in part [no date] (F--183051, Pa, S, T, W--58257). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Mus. Nac. Hist. Nat. Chile 68285 (Sg).

PSEUDOCARPIDIUM MULTIDENS (Urb.) Moldenke, Revis. Sudam. Bot. 5: 2. 1937.

Synonymy: Vitex multidens Urb. in Fedde, Repert. 20: 346. 1924.

Literature: Urb. in Fedde, Repert. 20: 346. 1924; Hill, Ind. Kew. Suppl. 7: 252. 1929; Moldenke, Revis. Sudam. Bot. 5: 2. 1937; Moldenke, Alph. List Common Names 9. 1939; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25 & 99. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Phytologia 2: 111. 1944; Moldenke, Alph. List Cit. 1: 185. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 185. 1947; Moldenke, Alph. List Cit. 2: 647. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 44 & 195. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 11. 1949; Roig, Dicc. Bot. 1: 344--345 and 2: 1115. 1953; Moldenke, Phytologia 5: 152. 1955; Alain in León & Alain, Fl. Cuba 4: 314--316 & 545. 1957; Moldenke, Résumé 53, 386, & 468. 1959.

Shrub or low tree; branchlets and twigs rather slender, very obtusely tetragonal or subterete, buff or gray, the younger parts finely short-puberulent with flavescent puberulence, becoming gla-

brescent in age; leaf-scars not prominent; nodes on younger parts distinctly annulate, less so on older wood; principal internodes 0.3--2 cm. long, often much abbreviated on stunted twigs; leaves decussate-opposite, simple, often crowded on very short twigs; petioles slender, 2--7 mm. long, densely short-puberulent like the young twigs, flattened above, not ampliate at the base; leaf-blades coriaceous, bright- or dark-green above, very pale or whitish beneath, oblong or narrowly elliptic, rarely oblanceolate, 0.9--8 cm. long, 0.4--2.3 cm. wide, acute and spinulose at the apex, obtuse at the base, abundantly spinulose-dentate from the base to the apex or sometimes entire near the base (rarely subentire throughout on stunted or immature leaves), glabrous and shiny above, very densely short-tomentulose beneath with whitish hairs, sometimes slightly subrevolute or undulate; midrib slender, usually slightly impressed above, strong and prominent beneath; secondaries very slender, numerous and close together, 6--18 per side, short, slightly ascending, varying from subimpressed to slightly prominent above, prominent and rather conspicuously anastomosing or arcuately joined near the margins beneath; vein and veinlet reticulation obscure, or the larger parts more or less prominent on both surfaces; inflorescence axillary and terminal, paniculate, rather loosely many-flowered, 4--6 cm. long, 1--2.5 cm. wide, composed of about 4 pairs of about 3-flowered cymules and a terminal one; peduncles filiform, flattened, 1.4--1.6 cm. long, densely short-puberulent like the twigs; rachis similar to the peduncle, its sympodia elongate; pedicels filiform, 1--2 mm. long, densely puberulent; bracts few, lanceolate or oblong, 5--7 mm. long, 1--2 mm. wide, entire, stipitate, densely puberulent; bractlets linear, numerous, 1--2 mm. long, densely puberulent; prophylla subulate-setaceous, minute, densely puberulent; fruiting-calyx patelliform, slightly enlarged, densely puberulent outside, not split, its rim distinctly 5-toothed; immature fruit flattened, distinctly and regularly 4-lobed with rounded lobes, densely short-pubescent throughout.

The type of this species was collected by Erik Leonard Ekman (no. 7728) in dry calcareous thickets between the city of Santiago and El Morro, Oriente, Cuba, on September 25, 1916, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is said to inhabit dry thickets on coastal hillsides. It has been collected in anthesis and in fruit from July to September. Herbarium material has been misidentified as P. avicennioides (A. Rich.) Millsp. Vernacular names recorded for it are "chicharran", "chicharrón", "copalillo", and "granadillo de costa". It is worth noting that the name "chicharrón" is applied also to P. wrightii Millsp., and is, in fact, applied throughout Cuba to various plants, mostly trees with hard wood, which have thick coriaceous leaves, most especially to Terminalia eriostachya A. Rich. In all, 8 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: CUBA: Oriente: Ekman 7728 (B--type, E--photo of

isotype, N--isotype, N--photo of type, N--photo of isotype, S--isotype, Z--photo of type, Z--photo of isotype); León 11652 (Ha, N), 17136b (Ha). Province undetermined: C. Wright 23 [Herb. Sauvalle 1788] (Hv, Hv).

PSEUDOCARPIDIUM PUNGENS Britton, Bull. Torrey Bot. Club 39: 10. 1912.

Literature: N. L. Britton, Bull. Torrey Bot. Club 39: 10. 1912; Prain, Ind. Kew. Suppl. 5: 209. 1921; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25 & 99. 1942; Moldenke, Alph. List Cit. 1: 61. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 44 & 195. 1949; Alain in León & Alain, Fl. Cuba 4: 314, 316, & 545. 1957; Moldenke, Résumé 53 & 468. 1959.

Tree, to 8 m. tall; branchlets and twigs rather slender, densely short-puberulent on the younger parts with brownish hairs, becoming glabrate and light-gray in age, rather obtusely tetragonal on the younger parts, subterete in age, stiff; nodes on younger parts distinctly annulate; principal internodes much abbreviated, 0.5--2.3 cm. long or less; leaves decussate-opposite, simple; petioles slender, 2--6 mm. long, densely short-puberulent with brownish hairs like the young twigs, very slightly ampliate at the base, flattened above; leaf-blades coriaceous [not "chartaceous" as stated by Britton!], light- or somewhat gray-green on both surfaces or somewhat darker beneath, varying from oblong or oblong-lanceolate to narrowly elliptic, 2.8--7 cm. long, 1.2--2 [not "3" as stated by Britton!] cm. wide, acuminate and spinulose at the apex, obtuse or subacute at the base, rather irregularly spinulose-dentate along the margins except toward the base and near the apex, sometimes subentire, glabrous and shiny above, dull beneath, glabrate and decidedly pustulate on the lamina beneath or more or less short-puberulent on the midrib and larger venation, often more or less revolute; midrib slender, usually somewhat impressed above, very strong and prominent beneath; secondaries slender, strong, 7--13 per side, slightly ascending, short, not much arcuate, but conspicuously anastomosing near the margins beneath, obscure or slightly prominent above, prominent beneath; vein and veinlet reticulation very fine and abundant, slightly prominent to the finest divisions above, only the larger portions prominent beneath; inflorescence axillary, much abbreviated, few-flowered; calyx campanulate, about 2 mm. long and wide, finely puberulent outside, glabrous within, its rim plainly 5-dentate with more or less apiculate teeth; corolla not known; fruiting-calyx somewhat enlarged, about 3 mm. long, puberulent outside, deeply split into two parts under the mature fruit, on part 3-lobed and the other 2-lobed; fruit flattened, very irregularly 4-lobed, 4--5 mm. long, 4--10 mm. wide, one lobe often much attenuate and spur-like, the other 3 lobes often each again slightly 2-lobulate, densely puberulent throughout, umbilicate at the base.